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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SHERMAN, STEPHEN G	
ART UNIT	PAPER NUMBER
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/651,589	MOYER, VINCENT C.	
	Examiner	Art Unit	
	Stephen G. Sherman	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,5,7,10-12,14-18,20-22 and 24-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,7,10-12,14-18,20-22 and 24-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed the 8 January 2007. Claims 1-2, 4-5, 7, 10-12, 14-18, 20-22 and 24-29 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-2, 4-5, 7, 10-12, 14-18 and 20-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claim 4, 10, 12 14, 20 and 24-29 are objected to because of the following informalities: Claim 1 recites the limitation of a capacitive **disc**, while all of the further references made in claims 4, 10,12, 14, 20 and 24-29 are made to said capacitive **disk**. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-2, 5, 11-12, 15, 17-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobachi et al. (US 6,326,948) in view of Gordon et al. (US 6,057,540).

Regarding claim 1, Kobachi et al. disclose an input device comprising:

a captive disc (Fig. 1, item 1) movably suspended over a sensor (Fig.1, see col. 8, lines 6-7), said captive disc having an active surface (Fig. 1, item 3) facing said sensor;

wherein said sensor is adapted to take successive images of the active surface of said captive disc (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface);

a horizontal spring allowing resistive movement of said captive disc in horizontal directions (Fig. 1, item 2, or Fig. 27, spring 2).

Kobachi et al. fail to teach a single embodiment featuring a horizontal spring as discussed above, as well as a vertical spring allowing resistive movement of said captive disc in vertical direction.

However, Kobachi does teach an embodiment with a vertical spring allowing resistive movement of a captive disc in the vertical directions (see Fig. 35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the vertical spring and the spacing created between

the sensor and captive surface of Kobachi et al.'s embodiment on Fig. 35 into the first embodiment of Kobachi on Fig. 1, where the motivation to combine is to create a device that allows movement in the X and Y direction in order to detect X-Y movements of a cursor control device, and also to allow movements in the vertical direction such that an additional type of input in the Z-direction can be sensed.

Although the device taught by Kobachi et al. would inherently need to compare the values calculated to some kind of previous value to determine movement, Kobachi et al. fail to explicitly teach of comparing the successive images to determine the movement of said capacitive disc.

Gordon et al. disclose of an input device in which a sensor is comprised of a plurality of photo detectors (Figure 1, item 9 and column 4, lines 37-45) in which movement of the surface is determined by comparing successive images (Column 3, lines 5-10).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to incorporate the method of comparing previous and current images to determine movement as taught by Gordon et al. in the movement determination device taught by Kobachi et al. such that the values calculated from the four sensors of Kobachi et al. would be used in comparison to previous values in order to provide a more accurate detection method for determining the movement of the capacitive disc.

Regarding claim 2, Kobachi et al. and Gordon et al. disclose the device recited in claim 1.

Kobachi et al. further disclose a device further comprising a frame (Fig. 1, item 6) housing said captive disc; and said horizontal spring (Fig. 1, item 2, see col. 8, 19-20) adapted to center said captive disc within said frame (Fig. 1).

Regarding claim 5, Kobachi et al. and Gordon et al. disclose the device recited in claim 1.

Kobachi et al. further disclose a device wherein said active surface comprises a navigation area (Fig. 1, where the surface of item 3 is the navigation area) and a border area (the bottom surface of item 1) generally surrounding said navigation area (Fig. 1, it is inherent that the surface area portion of item 1 that surrounds item 3); and

said sensor distinguishes between different patterns of the navigation area and the border area and suppresses any movement determined from the border area (Since column 8, line 45-64 explain that the sensor only receives light reflected from the reflective plate 3, the sensor does not detect movement from the border region, and therefore the movement of the border area is suppressed.).

Regarding claim 11, Kobachi et al. and Gordon et al. disclose the device recited in claim 1.

Kobachi further teaches a device further comprising a light source (Fig. 1, item LD) adapted to provide illumination on the active surface (col. 8, lines 26-28).

Regarding claim 12, Kobachi et al. disclose an input device comprising:

a captive disc (Fig. 1, item 1) movably suspended over said sensor (Fig.1, see col. 8, lines 6-7), said captive disc having an active surface (Fig. 1, item 3) facing said sensor;

wherein said sensor is adapted to take successive images of the active surface of said captive disc (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface);

an illuminant (Fig. 1, item LD) adapted to provide light toward the active surface (col. 8, lines 26-28);

a horizontal spring (Fig. 1, item 2) adapted to center said captive disc (Fig. 1); and

a vertical spring allowing resistive movement of said captive disc in vertical direction (as discussed above in regards to claim 1).

Although the device taught by Kobachi et al. would inherently need to compare the values calculated to some kind of previous value to determine movement, Kobachi et al. fail to explicitly teach of comparing the successive images to determine the movement of said capacitive disc and also fail to teach a focusing lens for focusing light from the active surface onto said sensor.

Gordon et al. disclose of an input device in which a sensor is comprised of a plurality of photo detectors (Figure 1, item 9 and column 4, lines 37-45) in which

movement of the surface is determined by comparing successive images (Column 3, lines 5-10), and a focusing lens for focusing light from the active surface onto said sensor (Figure 1, item 8 as described in column 4, lines 37-41).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to incorporate the method of comparing previous and current images to determine movement as taught by Gordon et al. in the movement determination device taught by Kobachi et al. such that the values calculated from the four sensors of Kobachi et al. would be used in comparison to previous values in order to provide a more accurate detection method for determining the movement of the capacitive disc.

Regarding claim 15, this claim is rejected under the same rationale as claim 5.

Regarding claim 17, Kobachi et al. disclose an electronic apparatus comprising:

a screen (col. 1, line 7) displaying information including an icon (col. 1, line 7);

an input device for controlling the icon (col. 1, line 6), said input device comprising:

a captive disc (Fig. 1, item 1) movably suspended over said sensor (Fig. 1), said captive disc having an active surface (Fig. 1, item 3) facing said sensor;

wherein said sensor is adapted to take successive images of the active surface of said captive disc (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected

light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface);

a horizontal spring allowing resistive movement of said captive disc in horizontal directions (Fig. 1, item 2, or Fig. 27, spring 2).

Kobachi et al. fail to teach a single embodiment featuring a horizontal spring as discussed above, as well as a vertical spring allowing resistive movement of said captive disc in vertical directions.

However, Kobachi does teach an embodiment with a vertical spring allowing resistive movement of a captive disc in the vertical directions (see Fig. 35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the vertical spring and the spacing created between the sensor and captive surface of Kobachi et al.'s embodiment on Fig. 35 into the first embodiment of Kobachi on Fig. 1, where the motivation to combine is to create a device that allows movement in the X and Y direction in order to detect X-Y movements of a cursor control device, and also to allow movements in the vertical direction such that an additional type of input in the Z-direction can be sensed.

Although the device taught by Kobachi et al. would inherently need to compare the values calculated to some kind of previous value to determine movement, Kobachi et al. fail to explicitly teach of comparing the successive images to determine the movement of said capacitive disc.

Gordon et al. disclose of an input device in which a sensor is comprised of a plurality of photo detectors (Figure 1, item 9 and column 4, lines 37-45) in which

movement of the surface is determined by comparing successive images (Column 3, lines 5-10).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to incorporate the method of comparing previous and current images to determine movement as taught by Gordon et al. in the movement determination device taught by Kobachi et al. such that the values calculated from the four sensors of Kobachi et al. would be used in comparison to previous values in order to provide a more accurate detection method for determining the movement of the capacitive disc.

Regarding claim 18, Kobachi et al. and Gordon et al. disclose the device recited in claim 17.

Kobachi et al. further disclose an apparatus further comprising: frame housing (Fig. 1, item 6) said captive disc; and said horizontal spring (Fig. 1, item 2) adapted to center said captive disc within said frame (Fig. 1)

Regarding claim 21, this claim is rejected under the same rationale as claim 5.

6. Claims 7, 10, 16, 22, 24, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobachi et al. (US 6,326,948) in view of Gordon et al. (US 6,057,540) and further in view of Bynum et al. (US 2006/0028442).

Regarding claims 24, 26 and 28, Kobachi et al. and Gordon et al. disclose the device recited in claims 1, 12 and 17.

Kobachi et al. also disclose wherein:

the horizontal spring returns said captive disk to a horizontal rest position said captive disk is released (Figure 27, items 2 are springs, which means that the device will return to its initial position when a user's finger is released);

the vertical spring returns said captive disc to a rest plane when said captive disk is released (Since a spring biases the input device, by the natural characteristics of a spring, the device will return to an initial position when a user's finger is released.);

said sensor determines the movement of said captive disk by taking the successive images of the active surface when said captive disc is proximal to a focal plane (see Fig. 7A and 7B, and see col. 9, lines 50-63, where the reflected light is imaged by the photodiodes PD1 to PD4, therefore it is taking successive images of the active surface, and column 9, lines 41-48 where it is inherent that the plane perpendicular to the optical axis that is mentioned here is the focal plane.).

Gordon et al. also disclose that the movement is determined when surface is proximal to a focal plane below a rest plane so that the active surface is in focus for said sensor (Figure 1 shows that the focal point is below the surface 5 rest plane shown in the Figure.).

Kobachi et al. and Gordon et al. fail to teach where said sensor does not determine the movement of said captive disk when said captive disk is released from the focal plane so that the active surface becomes out of focus for said sensor

Bynum et al. disclose an input device where said sensor does not determine the movement of said captive disk when said captive disk is released from the focal plane so that the active surface becomes out of focus for said sensor (Figure 7 shows an active region 34 of the dome shaped input device, while Figure 19 shows where the dome is deflectable as explained in paragraph [0106], and Figure 3 shows a configuration showing where the focal plane is located. Based on these Figures and the description of paragraph [0106], the examiner understands that when the dome is in a position as shown in Figure 3 the movement can be detected, however, when the dome is moved out of focus, x and y movement will not be detected.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the method taught by Bynum et al. of the detection surface being out of focus with the input device taught by the combination of Kobachi et al. and Gordon et al. in order to allow realize for the actuation of a switch in a z-axis direction as explained in paragraph [0106] of Bynum et al.

Regarding claims 7 and 22, Kobachi et al., Gordon et al. and Bynum et al. disclose the device recited in claims 24 and 28.

Gordon et al. also disclose a focusing lens adapted to focus light from a portion of the active surface to said sensor when the active surface is proximal to the focal plane (Figure 1, item 8 as described in column 4, lines 37-41).

Regarding claims 10 and 16, Kobachi et al., Gordon et al. and Bynum et al. disclose the device recited in claims 24 and 26.

Kobachi et al. further disclose a device further comprising a selection switch (Fig. 31, item 40) adapted to detect a user selection (see col. 17, lines 47-53, it is inherent that item 40 can be operated as a switch from the 2-dimensional plane to the 3-dimensional plane where a user makes a selection to move in the Z-direction by applying pressure to item 40).

Bynum et al. further disclose of a selection switch adapted to detect a user selection that moves said capacitive disk to a selection plane below the focal plane (Paragraph [0106]).

7. Claims 4, 14, 20, 25, 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobachi et al. (US 6,326,948) in view of Gordon et al. (US 6,057,540) and further in view of Bynum et al. (US 2006/0028442) and Hoshino et al. (US 2006/0082549).

Regarding claims 4, 14 and 20, Kobachi et al., Gordon et al. and Bynum et al. disclose the device recited in claims 24, 26 and 28.

Kobachi et al., Gordon et al. and Bynum et al. fail to teach a device wherein the active surface has a convex shape so a border area is out of focus of said sensor when said capacitive disk is in the focal plane.

Hoshino et al. disclose a device wherein the active surface has a convex shape (Figure 19B). Therefore, based on the combination of references, the border area as explained in the previous rejections would be out of focus of said sensor since the focal plane would be located below the surface of the convex shaped input surface.

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to made the input device taught by the combination of Kobachi et al., Gordon et al. and Bynum et al. in a convex shape as taught by Hoshino et al. in order to prevent input misinterpretation of the device when, for example, the device is located within a cell phone and the cell phone is within a user's pocket (See Figure 19A of Hoshino et al. and the bottom of paragraph [0139].).

Regarding claims 25, 27 and 29, please refer to the rejection of claims 4-5, and furthermore, the examiner understands that based on the convex shape and the focal plane location, the border area would be out of focus faster than the active surface, where the border area would be of a lower density since the active surface is meant for the determination of input and the border area is not.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kobachi et al. (JP 08-263198) disclose an input unit for moving the cursor on a screen using a light sensor that sensing a reflection of light from a detection surface, where movement can be detected in the x and y direction.

Kobachi et al. (JP 09-016325) also disclose an input unit for moving the cursor on a screen using a light sensor that sensing a reflection of light from a detection surface, where movement can also be detected in a z direction.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

8 February 2007

AMR A. AWAD
SUPERVISORY PATENT EXAMINER